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AUTHOR Moran, Robert F., Jr.
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ABSTRACT

The theoretical basis for an organizational structure determined by external as well as internal factors--the contingency model--is presented through a consideration of two studies. The current research and speculation which have updated and augmented this theory are also included, and a contingency approach to library organization is justified. The changing nature of the academic library is described, followed by a discussion of specific changes in the structure of an academic library that seem appropriate in the light of the external environment. (Author)

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CONTINGENCY THEORY AND ITS IMPLICATIONS FOR THE STRUCTURE OF AN ACADEMIC LIBRARY

by

Robert F. Moran, Jr.

Serials Librarian

University of Illinois

at Chicago Circle

July 22, 1978

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An understanding of recent organizational research is important for academic library managers. The evidence presented by this research that organizational success depends on environmental factors as well as internal efficiency, and the theoretical specification of elements in the environment as proper determinants of an organization's structure, suggest that academic library administrators pay attention to variables outside the library as well as those within it when establishing the relationships and roles that constitute the ongoing structure of a library or units within a library. The likelihood that external variables should be considered in the development of the organizational structure of an academic library provided the impetus for the research presented in this paper.

The main sections of the paper are as follows. The theoretical basis for an organizational structure determined by external as well as internal factors (the contingency model) is presented through a brief consideration of two ground-breaking studies. Then the current research and speculation which has updated and augmented this theory is outlined, and a contingency approach to library organization is justified. Next, the changing nature of the academic library environment is described. Finally, specific changes in the structure of an academic library that seem appropriate in the light of the environment are suggested.

A CONTINGENCY MODEL FOR ORGANIZATIONAL STRUCTURE

James Thompson presents a theoretical analysis of organizations as open systems whose success depends on achieving rational functioning despite significant dependence on irrational elements. Rationality is defined in terms of certainty and control; if a goal is desired, one will be able to achieve it if he has knowledge of and control over all elements necessary for

goal achievement. The emphasis of traditional management theory on planning and control flows from the perception of the importance of rationality in this sense.[1] However, it is obvious that no organization, dependent as it is on elements outside its jurisdiction for inputs, approval, and acceptance of its outputs can achieve this complete knowledge and control over all elements necessary for goal achievement. So Thompson conceives of "complex organizations as open systems, hence indeterminate and faced with uncertainty, but at the same time as subject to criteria of rationality and hence needing determinateness and certainty."[2] Control and certainty are most possible with regard to the raw material conversion process(technology) performed by the organization, and Thompson suggests that the successful organization will act in the way that will increase and assure this certainty. It will develop units that protect or buffer its technology from external uncertainty,[3] and that monitor[4] and deal with[5] the environment.

Thompson suggests that the success of an organization depends on how well it performs its particular technological function, and on how well it understands and controls the elements outside the organizational boundaries upon which it depends for resources, approval, and acceptance of its product. It is as important to recognize and interact with the environment as it is to operate and improve the organization's technology, and the structure of the organization must be established to facilitate this interaction.

At approximately the time Thompson was writing his book, Paul Lawrence and Jay Lorsch were conducting research on the relationships between different kinds of environmental characteristics and different kinds of businesses. These two scholars sought the answer to the question, "What kind of organization does it take to deal with various economic and market conditions?"[6] By means of questionnaires and interviews with top level managers and exec-

utives, they gathered data on the environment, technology, and organization of several companies in three different industries.[7] Their measurements showed that structure differed according to type of industry and according to the effectiveness of the company. Companies facing dynamic and diverse environments were found to have more differentiated departments with regard to goal, time, and interpersonal orientation of the department's manager and with regard to formality of structure, than companies facing more stable environments. In addition, the more effective companies in a particular industry had departmental differentiation more in line with environmental requirements than less successful companies.[8]

This research provides evidence that formal structural characteristics (formal roles and relationships) can be different in different environments. Also, in finding that companies with the hypothesized environmentally based structure performed more effectively, it indicates that the nature of these characteristics might be determined by the environment.

CURRENT RESEARCH

Some research published since 1973 clearly points to environmental characteristics as determinants of an organization's structure. Jeffrey Pfeffer published two studies in 1973. In the first[9] he considers differences in the make-up and function of hospital boards as a function of the hospital's environment. The environment is defined in terms of the source of hospital funds and the make-up and influence of the local community. Pfeffer verified the hypothesis that the primary function of boards of privately funded hospitals was fund raising, while administration was the concern of hospitals which received the major portion of their funds from the government. The size of the boards was positively related to the proportion of the hospital's funds from private donors, the importance of fund raising, and

influence in the community as a criterion for selecting board members. The importance of selecting board members for their political connections was positively related to the reported influence of political organizations on hospital decisions, and the proportion of funds received from the government, and negatively to the proportion of funds received from insurance payments. The evidence supports Thompson's contention that the reason for the existence of boundary units is the need to control the environmental sectors upon which the organization depends.

In a second study[10] Pfeffer, in collaboration with Huseyin Leblebici, demonstrates a relation between competition(the environmental variable) and control structures. They found that the competitive environment was positively related to centralization and formalization in the companies studied, while the absence of competition combined with internal diversity(frequent change in product design and in the production process, and a large number of products) was positively related to decentralization, less formalization and more departments. Their failure to find a relation between the environment and internal structure in all instances(centralization and formalization exist in both the competitive and non-competitive environment in the absence of internal diversity) is evidence for the prior importance of internal determinants of structure. However, the indicated relationship between competitiveness and centralization and formalization, whether internal diversity exists or not, shows that the environment is very important at times.

D. Hellriegel and J.W. Slocum[11] describe the structures of several major corporations and the environments in which these organizations operate. Variations in the external environment along a certainty/uncertainty scale and in the internal environment along an integration scale result in dif-

ferent structural characteristics.. Although these authors make no attempt to define their terms precisely or verify the suggested relations statistically, the logic of their presentation and the obvious realities they describe give significant weight to their argument for environmentally determined structure.

The structure of sheltered workshops(small businesses established to provide work and rehabilitation for the physically handicapped) was studied by J.R.Kimberly.[12] He hypothesized that the structure of workshops founded before significant social and governmental commitment to the rehabilitation of the physically handicapped would be different from the structure of workshops funded at the time of environmental support. He states, "Empirical support was found for the hypothesis and this finding suggests the utility of a general theoretical perspective which views organizational structure as the product of interacting constraints, both internal and external, which are subject to varying degrees of control by organizational members."[13]

In theorizing about the major cause of current turbulence in and about organizations, William R. Rosengren looks to the environment.[14] New cultural norms(the broadening of the conception of citizens' rights and democratization, a collectivized view of organizations as obliged to perform commonweal functions, and the awareness that organizations are composed of general resources which can be turned to a variety of means and ends) place organizations in a "nutcracker" facing the withdrawal of resources, interruption of activities, and the withdrawal of consumer willingness to accept their products. To the extent that this analysis is true, Rosengren states that organizations must do more than adapt or adjust to the external contingencies of strife and contention; they must actively engage in coping with the environment.

Paul Hirsch presents an excellent argument for the importance of being aware of and controlling environmental constraints in his consideration of the pharmaceutical and phonograph record industries.[15] The pharmaceutical industry had a substantially higher annual rate of return on investment from 1950 to 1965 than the phonograph record industry even though the industries are surprisingly similar. For instance, both are process production industries employing highly mechanized and relatively simple batch production technologies, both are dependent on external gatekeepers to introduce their products to new customers, and both place a high premium on product innovation, exist in legal environments predicated upon patents, trademarks, and/or copyrights, were stimulated by important technological inventions since World War II, and experienced growth and expansion well above average for most manufacturing industries.

Pharmaceutical companies were able to influence significant environmental groups so that these groups acted in ways that were favorable to the pharmaceuticals, while the phonograph record companies were unable to achieve similar results with regard to their environment. Specifically, when new techniques and significant rates of return drew new entrants to each industry, existing pharmaceutical companies influenced the U.S.Patent Office and state regulation agencies to give patent law interpretations and inact drug substitution regulations that were favorable to existing companies and, in effect, kept barriers to entry into the industry high. These companies also influenced the American Medical Association to liberalize advertisement policies for drugs in their journals and to restrict AMA's regulatory activity with regard to drugs. These actions by the AMA gave the companies the opportunity to influence the external agents upon whom they relied for introduction of their products(the physicians) substantially and easily.

Phonograph record companies were unable to get favorable patent laws and patent interpretations and were unable legally to influence their gatekeepers (disk jockeys). Although the reasons why one industry was able to influence external elements substantially and one was not are uncertain, the fact remains that the industry that did gain significant control over important environmental sectors was substantially more successful than the one that did not.

While the preceding studies offer evidence that a contingency model is appropriate, other studies raise some serious questions. A group headed by H. Tosi attempted to demonstrate the validity of the uncertainty measuring instruments of Lawrence and Lorsch. The results were very disappointing; the relationship between uncertainty measured by the Lawrence and Lorsch instruments and external measures chosen by Tosi for a set of business concerns was consistently negative. Since, as the authors state, "One would expect at least a positive correlation between internal(the instrument) and external measures of uncertainty,"[16] it would seem that Lawrence and Lorsch may not have measured real environmental uncertainty.[17]

Downey, Hellriegel and Slocum[18] attempted to replicate a study by R.B. Duncan[19] in which he showed a relationship between perceived environmental complexity and the uncertainty of a task. They failed to establish the expected relationship and questioned Duncan's measure of environmental complexity. In addition, they found no significant correlation between the instruments of Lawrence and Lorsch and Duncan. They suggest that significant ambiguity exists with regard to uncertainty concepts in organizational theory and they state that their findings should place researchers on guard about the potential pitfalls that may exist in current uncertainty conceptualization and application.

Where the preceeding authors question uncertainty measures, R.N.Osborn and J.G.Hunt[20] find no relation between complexity and organizational effectiveness and on this basis suggest that the environment is not a prime concern when planning for goal achievement. And in a descriptive study, H. Stieglity[21] attributes differing structural characteristics primarily to the internal dimensions of 1) diversification (the variety of goals and of services produced) and 2) interdependency, integration, or overlap among diversified operating components. While he acknowledges diversity in the market place as a determinant of structure, his point seems to be that the primary causes of structural differences are internal..

In a study published in 1975[22] Johannes M. Pennings attempted to demonstrate a relationship between several measures of environmental uncertainty (instability, resourcefulness, demand volatility, competitiveness and complexity) and several measures of low formality of structure and decentralization(informal communication, participativeness, frequency of meetings, specialization and power equalization). Most correlations were negative and/or insignificant rather than high and positive as expected and he states, "Summarizing, with the exception of complexity and resourcefulness, none of the environmental variables seemed to be relevant for understanding why organizations differed structurally."[23] Pennings then suggests that his failure to achieve the expected results might have been due to the fact that he did not consider the effectiveness of the units studied; i.e., the inclusion of ineffective units may have reduced the magnitude of the correlations. A two way analysis of variance to determine the effects of environment and structure and their interaction effects on several effectiveness indexes was performed to check this possibility out. The tests for interaction between structural and environmental variables were not significant, and effectiveness

was explained primarily by structural rather than environmental variables. He closes by stating, "From the results obtained one questions the usefulness of the structural-contingency model."[24]

The lack of certain evidence for specific environmental/structural relationships pointed to in these studies is emphasized in a review article by Dennis Moberg and James Koch.[25] They note that not only is it uncertain that operationalized definitions of environmental characteristics have construct validity, but also, aggregate contingency models make improper assumptions about the convergence of existing studies with regard to the domains studied. They state that a valid overall contingency approach that directs application has not yet been developed.

VALIDITY OF A CONTINGENCY APPROACH TO THE DEVELOPMENT OF THE ORGANIZATIONAL STRUCTURE OF AN ACADEMIC LIBRARY

Despite the criticism of contingency studies, the validity of the contingency approach can not be seriously questioned. In the first place, the importance of the environment has traditionally been stressed by businessmen. Knowledge of the opportunities and constraints of the market has been key to the success of most businesses. The desire to understand and control the market has led to the increased importance of the marketing function in business concerns since the arrival of the permanent buyers market shortly after World War II. The successful entrepreneur has been the individual who understood the market and took advantage of the opportunities it offered. Second, the logic and common sense of the analyses of theoreticians like Thompson carry significant weight. No organization's domain is all inclusive, inputs must be obtained from others and outputs must be taken by others. To assume that internal efficiency is adequate for continuing success denies this reality. All organizations are dependent on individuals and groups

outside their boundaries, and efforts to control or at least understand them are important.

Next, difficulty replicating studies with regard to something as varied and complex as the environmental relationships of a large organization, and specific problems with the instruments used in some of these studies, do not remove the fact that over the past fifteen years several sound independent studies have shown specific relationship between the environment and structural characteristics. Finally, the relevance of the environment for the academic library is stressed by Beverly Lynch in an article published in College and Research Libraries.[26] Ms. Lynch notes the practice of distinguishing library organization and problem-solving according to types of libraries (public, school, etc.). She expresses concern because no substantial organized research on the academic library's environment exists, and she points out some of the advantages of looking at the library as an open system. A contingency approach to organizational structure, an approach that says there is more than one way to structure an organization and achieve success, and that peculiarities of the time and place are crucial in the choice of structure at that time and place, is valid.

The failure to replicate some of the original contingency studies and the questions raised about the measures used in these studies do show that specific environmental/structural relationships cannot be identified with certainty. That is, while the importance of the environment for the success of the academic library is certain, there is no evidence which clearly points to specific structural adaptations which every library should make given particular environmental characteristics.

Given the validity of the contingency approach along with the lack of certainty with regard to specific environmentally determined structural

characteristics, this is the question to be answered: " Is a more complete and ongoing understanding of and control over the environment important enough for the academic library to make some structural changes for the purpose of enhancing this understanding and control even though the effect of these changes is not certain?" A successful organization facing a stable environment probably should make no major changes. Academic libraries do, however, seem to be facing a changing and uncertain environment at this time.

THE CURRENT ENVIRONMENT OF AN ACADEMIC LIBRARY

Here environment means the organizations and groups outside the academic library upon which the library depends for inputs and approval, and which accept its outputs. Substantial changes in the orientation, goals, action patterns, or outputs of these groups can result in new demands, constraints, and opportunities for the academic library. As one unit in a larger organization, the university, the most important aspects of the academic library's environment are the other formal and informal groups in the university; the university administration, the faculty, the students,and other university support units. Outside the university, the library interfaces directly with the publishing industry, the library profession, and other groups involved in information processing.

The place of higher education among the nation's priorities, and the form its institutions will take in the near future is far from certain. The unprecedented funding of the sixties has ceased and the university faces a substantially increased number of competitors for a decreased pool of funds in both the public and private sector. At the same time that universities are finding it difficult to fund traditional programs, social concern for relevance and currency presses for new programs. In addition,

the educational process is being questioned. The restrictions of traditional practice in terms of entrance requirements, classroom education, and terminal points (degrees) are being criticized. Also, arguments for more faculty/student contact and independent study are heard, and some programs leading to external degrees have been reported.[27] An extreme example of more recent thinking with regard to the educational process but one of special interest to librarians is the concept that the college and library ought to be synonymous and the dominant learning mode ought to be independent study guided by faculty.[28]

Eldred R. Smith highlights the necessity for an academic library to be aware of any change in the priorities and processes of its university community.

> In the past university libraries have been judged in essentially quantitative terms: the size of collections, staff, and operating budget. Despite frequent verbal recognition that "the library is the heart of the university," it has been seen essentially as a repository of printed material, and its functions have been recognized as essentially routine, custodial operations connected with the acquisition, storage, and circulation of this material. In the future, university libraries may well be judged in qualitative terms; the degree to which the assembled collections meet academic program needs, the level of sophisticated service that is provided to faculty and students, the contribution that is made to the educational programs through bibliographic instruction, and the efficiency of basic operations.[29]

In addition to uncertainty about the future course of its parent university, the academic library faces competition for the role of primary processor and deliverer of information to faculty and students. Already, special university units exist for handling non-print media (e.g., film and computer data bases), and external organizations can provide essential information sometimes not available through the library (e.g., United States census data in machine readable form).

External input organizations cause the academic library additional

uncertainty. Primarily because of current economic conditions, publishers no longer look upon libraries as allies, institutions which are certain to take a significant portion of their product. As a result, they are seeking substantial control over the library's choice of inputs as their efforts with regard to the recent copyright legislation exemplify. At the same time, the quantity of books and journals published annually shows no sign of diminishing. This situation can only continue to make selection and acquisition decisions more uncertain than in the past.

New technologies for recording and processing information have special significance for libraries. Microforms have had little acceptance in academic libraries, but this is partially due to the inadequacies of a developing technology. Improvements in these forms and in their delivery mechanisms are of special interest to librarians. Also, continuing improvements in the processing and retrieval capabilities of computers are important to libraries.

Substantial and serious commitment to cooperation is another new element in the academic library's environment. Librarians have spoken highly of cooperation for years, but it is only recently that these words have been formalized through the establishment of networks and consortia throughout the country. E.J.Josey speculates that by the year 2000 all academic libraries will be members of at least one library network that will provide them with access to a national network.[30]

Finally, the government through the National Commission on Libraries and Information Science will play a significant role in the future of each academic library. The controversy reported in the professional literature over the various statements and plans of this group is an indication that the course of the Commission is anything but certain.

The above is by no means a complete listing of all significant factors in the environment of an academic library. It is, however, sufficient to indicate that a substantial amount of uncertainty exists.

THE CURRENT STRUCTURE OF AN ACADEMIC LIBRARY

Before considering changes in the structure of an academic library, a brief outline of the current structure is appropriate. Structure is the set of formal relations between groups of library employees, the set of formal roles filled by the individual employees, and the rules and procedures which direct the activities of these individuals. Almost every academic library is divided into two divisions, one (technical services) grouping all employees who are concerned primarily with the acquisition and processing of books and other information sources, and the other (public services) grouping all employees who deliver books and information to the public. Departments exist within each division and these too are defined by the function performed (the collections development department selects the books, the acquisitions department buys them, the cataloging department catalogs them, etc.). Authority is ultimately held by the library director and it is passed down through the division and department heads in the classic hierarchical manner. Although exceptions can be found, each employee generally does one kind of a job (specialization) and follows specific formal procedures in doing it (standardization). Thus the current structure of an academic library does resemble the bureaucratic model. Rules, roles, and relationships are clearly specified, authority delegated, and control maintained through the hierarchy.

RECOMMENDED STRUCTURAL CHANGES

In summary, consideration of the environment when establishing an organization's structure is important; the academic library today faces an uncertain environment with a structure that seems more suited for an

interface with a stable, certain environment; changes in the current structure of an academic library are needed to better survey and control the environment. It is in the attempt to suggest specific changes in the current structure of an academic library that the absence in the current literature of general agreement with regard to structural characteristics appropriate for different environmental states causes the most difficulty. In the absence of this agreement I must rely on the theorizing and as yet unreplicated research that does exist.

These studies suggest that an uncertain environment is most appropriately responded to by a structure with a minimum number of rules and regulations, and with decision making located near the organization's boundaries.[31] Lawrence and Lorsch found lower formality of structure to exist in departments facing a more uncertain environment, and state "The more certain and predictable the task, the more appropriate it is to be specific in job descriptions and rules. The reverse, of course is true."[32] In their study of the effect of competition,[33] Pfeffer and Leblebici found change and heterogeneity within the organization associated with decentralization and less formalization. In considering the appropriate structure of boundary units, Thompson states that divisions and departments established to deal with a dynamic yet homogeneous environment will be decentralized with regard to decision making.[34] So, few rules and regulations in units dealing with the environment along with the authority to make significant decisions at the unit level are appropriate structural elements in the face of environmental uncertainty.

Where should these elements be found in an academic library? Not in the cataloging department for it does not relate directly with the environment. Not in serials, acquisitions, circulation or reference departments

for Beverly Lynch[35] has demonstrated that the tasks performed in these departments are essentially routine, and a bureaucratic structure is best for the effective performance of routine tasks as Lawrence and Lorsch acknowledge.[36] In suggesting the structure of these units remain the same, that rules and regulations remain important for these departments and that the library director and division heads continue to make major decisions relating to the work of these departments, I am choosing efficiency in operation over environmental surveillance because of the known value of the bureaucratic structure in these departments and the unproven value of environmentally determined structural adaptations.

The selections or collection development department is a boundary unit interfacing with publishers, faculty, students, and other libraries with regard to coordinated acquisitions and shared resources. The selection function is more varied than most other library jobs, encompassing the responsibility for keeping aware of the current state of the collection, trends in publishing, and faculty and student needs as well as selecting specific books for purchase. For these reasons it seems the most likely location for structural characteristics that enhance environmental surveillance rather than internal efficiency. The general library bureaucratic pattern, then, should not be extended to the collection development department. The job descriptions for individuals in this department should be general, and rules handed down from above few. In addition, this unit should be given authority to make decisions regarding ordering matters without review (i.e., no one should have veto power over suggested acquisitions). And serious consideration should be given to raising the department to the division level so that its members have as much power as possible in their dealings with individuals in the environment, and so that information

gathered from the environment will have a direct channel to the center of the organization.

This recommendation does not seem sufficient in the light of the several environmental factors mentioned earlier that are uncertain and may present the academic library with significant constraints or opportunities. The book selectors can not remain aware of all these factors. The academic library staff is too small to allow the formation of a boundary unit specifically for the surveillance of environmental areas, but the library has a special advantage in the number of professionals on its staff. Their broad interests in librarianship, education, and often a subject field automatically put them in contact with many environmental sectors, and the number of professionals in an academic library almost assures contact in all significant areas. In fact, it is probably through the professional librarians that the academic library has kept as aware of its environment as it has. This informal role needs formalization to encourage it, and to provide adequate channels for information flow to the heart of the organization where policy and decisions are made.

The professional staff of the library should serve as the source for a new organizational group of five to six members. The purpose of this group would be to assist in general planning and policy making at the highest level, thereby providing the organization the opportunity to use the group's knowldege of and feel for the environment at the point where significant organization directing decisions are made. It is essential that the group be formally constituted and given the status of an operating department so that the members have adequate power and recognition. It is essential that the group participate in planning and policy making rather than function in merely an advisory capacity. I am suggesting that overall

planning and policy making be performed by a group which is made up of the traditional key hierarchical figures and a set of individuals drawn from the professional staff. There is precedent for the involvement of staff professionals in organization policy making. Teachers are involved in the policy making of their school, and staff doctors are involved in hospital policy making.

SUMMARY

Although evidence for specific environmentally determined structural characteristics is uncertain, a contingency approach to the development of the structure of an organization is clearly called for. An organization's structure, the permanent relations among its employees and the roles they fill, must be formed with internal efficiency and environmental surveillance in mind. The academic library today faces an environment that is qualitatively different from the environment it faced ten to fifteen years ago, and that environment is uncertain. The library must take this into account and structure itself in such a way that it will be aware of and continue to be aware of significant environmental changes. Since research gives no certainty with regard to the kind of structural changes that are necessary, no substantial changes can be justified. However, it is reasonable to attempt to see that the department that already has boundary and environmental surveillance characteristics, the collection development department, be provided with the kind of structure that seems appropriate in an uncertain environment, and that the formal structure recognize and use the professional environmental awareness that already exists in the organization.

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